***Science Process: Tools and Technology- Chromatography*** – Which Ink is the Ransom note written in?

SUMMATIVE LAB

***Standard: Scientific Inquiry***

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| **Level Tools & Tech** | **Expert** | **Practitioner** | **Apprentice** | **Novice** |
| ***Scientific Question*** | An experiment question is written that:   1. is in the form of a question 2. is specific to the task 3. is a testable question 4. includes at least one variable | Completes 3 out of the 4 listed requirements | Completes 3 out of the 4 listed requirements | Completes 0 or 1 of the listed requirements |
| ***Scientific Procedures-*** *Accurate Data* | Does all 4:  1) Marks and labels beginning and end of ink  2) Marks and labels beginning and end point of solvent  3) Measures ALL color components  4) Measures solvent movement | Completes 3 out of the 4 listed requirements | Completes 3 out of the 4 listed requirements | Completes 0 or 1 of the listed requirements |
| ***Scientific Procedures*** | Include the following:  1) Thorough (no steps left out)  2) Numbered steps  3) Begin with a verb  4) Specific to the task | Completes 3 out of the 4 listed requirements | Completes 2 out of the 4 listed requirements | Completes 0 or 1 of the listed requirements |
| ***Scientific Communication-***  ***Data Tables****-* | Data organized accurately in a table: variables in correct columns, sufficient number of trials, units of measurement are labeled, tables have title and labels for each column. | Data organized accurately in a table but missing one of the following: variables in correct columns, sufficient number of trials, units of measurement are labeled, tables have title and labels for each column. | Data organized accurately in a table but missing two of the following: variables in correct columns, sufficient number of trials, units of measurement are labeled, tables have title and labels for each column. | Data organized accurately in a table but missing three or more of the following: variables in correct columns, sufficient number of trials, units of measurement are labeled, tables have title and labels for each column. |
| ***Scientific Communication/Using Data- Conclusion/Analysis*** | Does all 4:   1. Correctly ID crime scene ink for ransom note using Rf data 2. Explains why other inks were excluded using Rf data 3. Explain the process of chromatography using scientific vocabulary 4. Any new applications/context/ questions | Completes 3 of the 4 requirements listed | Complete 2 of the 4 requirements listed | Completes 0 or 1 of the requirements listed |